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Nanotip-formation processes in electric fields

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The vacuum arc processes are believed to be initiated by the formation of nanotips on the metallic surface under the influence of strong electric fields. However, the exact mechanism for how these kind of nanotips would form has so far not been identified. In this work, we will present results from Density Functional Theory (DFT) and Kinetic Monte Carlo (KMC) studies on how the migration of adatoms are influenced by electric fields and how a biased migration may result in growth of nanotips on metallic surfaces. The results are compared with experimental results in the literature. We will also present studies from recent Scanning Electron Microscope (SEM) studies where, among other things, carbon nanotips were observed to form by deposition on gold electrodes in an applied field.

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